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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/534,931

05/13/2005

Shunpu Li

05-372

3671

20306

7590

08/04/2008

MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP
300 S. WACKER DRIVE
32ND FLOOR
CHICAGO, IL 60606

EXAMINER

BROWN II, DAVID N

ART UNIT

PAPER NUMBER

4111

MAIL DATE

DELIVERY MODE

08/04/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/534,931	Applicant(s) LI, SHUNPU	
	Examiner DAVID N. BROWN II	Art Unit 4111	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 9-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 5/13/2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-8, drawn to a template.

Group II, claim(s) 9-13, drawn to a method of manufacture of a structure on the nanometer scale.

Group III, claim(s) 14-26, drawn to a method of making a template.

The inventions listed as Groups I, II, and III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The common technical feature in all groups is the template of claim 1. This cannot be a special technical feature under PCT Rule 13.2 because the claimed template in this claim is known in the prior art. US Patent Application Publication 2002/0132482 (Chou) teaches in paragraph [0021] that the substrate typically comprises a semiconductor material such as silicon. Continuing in the 4th line of the same paragraph Chou teaches the film can be a thermoplastic polymer such as PMMA. The arrangement of the polymer on the silicon wafer can be seen in figure 2 of the Chou patent. Here the film is labeled 21 and the wafer is labeled 20. In paragraph [0029] lines 4-7, Chou teaches that the molded film will be patterned with raised features and recesses. Chou

mentions the stresses (heating and cooling) in paragraph [0028] from line 6-10. For this reason, a holding that these groups do not have a single general inventive concept is proper.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

2. During a telephone conversation with Richard MacHonkin on 8 July, 2008 a provisional election was made WITH traverse to prosecute the invention of I claims 1-8. Affirmation of this election must be made by applicant in replying to this Office action. Claims 9-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant's election with traverse of group I claims 1-8 is acknowledged. The traversal is on the ground(s) that claim 9 is a dependant claim and that group III is the process for making the template of group I.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because it seems that "Substrate", "Polymer", and "Ge" labels have all been used to designate the same part. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

6. Claims 1 and 6 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 6,755,984 (Lee).

Applicant requires a layered template with a substrate and textured polymer layer. Applicant requires the use of a single-phase polymer. For the purposes of this action, "phase" will be taken to refer to the state of matter, for example; solid, liquid, or gas. The polymer layer hardens and solidifies upon curing making it a single phase layer. In figure 2 there is a substrate (205) layer and a mask (203) layer. The mask layer is made from a polymer according to column 1 lines 33-34 and its texture/impression (207) is formed by application of compression force (i.e. by inducing stress" to the polymer. While the end product comprising textured mask layer and substrate of Lee et al is taken to be capable of functioning as a template since it is capable of imprinting a surface of a substrate such as a curable gel.

Claim 6:

The nano-size impressions (207) are shown in figure 2 to be substantially parallel. They are taken to be the grooves as claimed by the applicant. The spaces

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(206) separating the lines (204) according to figure 5 are shown to be parallel. They are also taken to be grooves as claimed by applicant.

7. Claims 1, 2, 4, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,849,558 (Schaper).

Applicant requires a layered template with a substrate and textured polymer layer. In figure 13a, one such template is displayed. This template (610, 620, and 630) comprises an adhesive coated carrier (620 and 630 is taken to be the substrate) and a textured polymer layer (610; taken to be the claimed polymer layer). Since the textured polymer is completely solid, it is considered to be a single phase. Stress is induced during the imprinting steps forming the template (610) when it is impressed by the master (600) as in any of the prior art examples provided in figures 1-4 or in figure 12 according to the Schaper invention.

Claims 2 and 4:

The sputtered-on layer (1302) may be a layer of germanium is applied onto a surface of the textured polymer layer as taught in claim 40 and as shown in figure 13a.

Claim 8:

According to column 8 lines 38-39, the germanium layer has a thickness in the order of 10nm.

8. Claims 1, 3, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Chou (US 2002/0132,482).

Chou teaches in paragraph [0021] that the substrate typically comprises a semiconductor material such as silicon. Continuing in the 4th line of the same

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paragraph Chou teaches the film can be a thermoplastic polymer such as PMMA. This polymer would have to be completely solidified in order to function as intended; therefore it is a single-phase polymer. The arrangement of the polymer on the silicon wafer can be seen in figure 2 of the Chou patent. Here the film is labeled 21 and the wafer is labeled 20. The combined device (20 and 21) is taken to be the template claimed. In figure 4b, the patterns made in the PMMA can be seen as there are recesses (41) and thick regions (43). In paragraph [0029] lines 4-7, Chou teaches that the molded film will be patterned with raised features and recesses. Chou mentions the stresses (heating and cooling) in paragraph [0028] from line 6-10. Also, the imprint method used to create the recessed patterns in the device can be seen as another induced stress. For the same reasons set forth above, the result article of Chou is taken to be capable of functioning as a template.

Claim 3:

Chou uses PMMA for the polymer layer as previously discussed.

Claim 5:

Chou teaches in paragraph [0021] that the substrate typically comprises a semiconductor material such as silicon.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chou as applied to claim 1 above

Chou teaches in paragraph [0020] that the thickness of layer (21) can be from .1nm to 10µm. Applicant claims a narrower range of 50-300nm. It would have been obvious to one having ordinary skill in the art at the time of the invention to form the polymer layer such that it has a thickness recited in this claim because one in the art would have chosen a thickness range which falls within the workable range taught by the prior art reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID N. BROWN II whose telephone number is (571)270-5497. The examiner can normally be reached on Monday-Thursday 7:30a-5:00p EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sam Yao can be reached on (571)-272-1224. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DAVID N. BROWN II/
Examiner, Art Unit 4111

/Sam Chuan C. Yao/
Supervisory Patent Examiner, Art Unit 4111